

Lower Rio Grande Flood Control Project – Interior Floodways

Rehabilitation of North Floodway (North and South Levees) and Arroyo Colorado Floodway (North Levee)

Hidalgo and Cameron Counties, Texas

**US INTERNATIONAL BOUNDARY & WATER COMMISSION
GOVERNING TECHNICAL SPECIFICATIONS AND PROVISIONS**

DIVISION 02 – EXISTING CONDITIONS

Lower Rio Grande Flood Control Project – Interior Floodways

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SPECIFICATION 02 02 00
EXISTING CONDITIONS & FACILITIES

This specification includes administrative and procedural requirements for worksite demobilization and cleanup; submission of project record documents, inspection and correction of unsatisfactory conditions, if necessary; and final inspection prior to final progress payment, and includes the following:

- 1.1 Related Documents, Contract Clauses, & Specifications
- 1.2 General
- 1.3 Rights of Way
- 1.4 Survey Markers
- 1.5 Roadways and Appurtenances
- 1.6 Utilities
- 1.7 Trees, Vegetation, & Other Landscape Features
- 1.8 Notification by the Contractor
- 1.9 Protection from Floods
- 1.10 Groundwater / Dewatering
- 1.11 Site Condition Documentation
- 2.0 Materials and Equipment (Not Applicable to this Specification)
- 3.0 Construction Methods (Not Applicable to this Specification)
- 4.0 Measurement and Payment

PART 1 - GENERAL

1.1 RELATED DOCUMENTS, CONTRACT CLAUSES, & SPECIFICATIONS

The following may not include all related documents, contract clauses, & technical specifications, and does not relieve the Contractor of the responsibility of performing work associated with this specification in accordance with all terms of the Contract herein.

- A. Related documents: As described in paragraph 1.2 of SPECIFICATION 01 01 00.
- B. Contract: Section I, 52.236-21 “Specifications and Drawings for Construction”
- C. Technical Specifications: All

1.2 GENERAL

In general, the Contractor shall protect all existing survey markers; roadways and roadway appurtenances; utilities, facilities, and trees / vegetation within the right of way or adjacent properties not designated for modification, construction, and/or removal, and shall restore damaged or temporarily relocated utilities, facilities, and trees / vegetation to a condition equal to or better than prior to such damage or temporary relocation, all in accordance with the Contract Documents.

1.3 RIGHTS OF WAY

- A. The Contractor shall not do any work that would affect any survey markers; roadways and roadway appurtenances; utilities (oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line); any landscape feature (trees / vegetation); any fence; any facility; or

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any other structure, nor shall the Contractor enter upon the rights of way involved until notified that the Government has secured authority therefore from the proper party.

- B. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support, or otherwise protect such survey markers; roadways and roadway appurtenances; utility; any landscape feature; any fence; any facility; or any other structure, or replace the same.

1.4 SURVEY MARKERS

- A. The Contractor shall not destroy, remove, or otherwise disturb any existing survey markers without proper authorization from the COR. Unauthorized disturbance of survey markers or points by the Contractor shall be accurately restored after construction activities have been completed.
- B. The Contractor is to contact the USIBWC Mercedes Field Office for location of survey markers prior to construction operations.
- C. The Contractor shall be required to restore survey markers that are located on the existing levee and will be disturbed by the raising of the levee or other construction operations. Restoration of the survey markers shall be in accordance with SPECIFICATION 01 71 00.

1.5 ROADWAYS AND APPURTENANCES

- A. Signs and Markers. The Contractor shall not destroy, remove, or otherwise disturb any existing roadway signs or markers, unless otherwise specified in the plans. The Contractor shall accurately restore or replace any existing roadway signs or markers immediately, and as approved by the owner of the roadway.
- B. Pavement or Paved Structures. All paved areas cut or damaged during construction shall be replaced with similar materials of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the owner of the pavement of paved structures. The pavement restoration requirement to match existing sections shall apply to all components of existing sections, including sub-base, base, and pavement. Temporary and permanent pavement shall conform to the requirements of the affected pavement. Pavements which are subject to partial removal shall be neatly saw-cut in straight lines.
 - (1) Temporary Resurfacing. Wherever required by the public authorities having jurisdiction, the Contractor shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.
 - (2) Permanent Resurfacing. In order to obtain a satisfactory junction with adjacent surfaces, the Contractor shall saw-cut back and trim the edge so as to provide a clean, sound, vertical joint

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before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw-cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

- C. Sidewalks or Private Driveways. Wherever sidewalks or private roads have been removed for purposes of construction, the Contractor shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions. If no such period of time is so fixed, the Contractor shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

1.6 UTILITIES

- A. The Contractor is required to hire a utility locator to survey the project limits to locate any utilities not indicated in the Contract Drawings. The Contractor shall immediately notify the COR of any located utilities not indicated in the Contract Drawings; immediate verbal notification is to be followed-up with written notification to the COR within 48 hours.
- B. All other underground utilities and other improvements which may be impaired during construction operations shall be protected by the Contractor, regardless of whether or not the utilities are indicated in the Contract Documents. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.
- C. The Contractor shall be responsible for exploratory excavations as it deems necessary to determine the exact locations and depths of any utilities, including irrigation facilities, which may interfere with its work. All such exploratory excavations shall be performed as soon as practicable after Notice to Proceed and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's progress. When such exploratory excavations show the utility location as indicated in the Contract Documents to be in error, the Contractor shall so notify the Government.
- D. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.
- E. Utilities to be Moved. In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the Government to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Government a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.
- F. Utilities to be Removed. Where the proper completion of the Work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is

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indicated, the Contractor shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Government and the owner of the facility. In all cases of such temporary removal or relocation, restoration to the former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

- G. **Government's Right of Access:** The right is reserved to the Government and to the Governments of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the Work of this Contract.
- H. **Underground Utilities Indicated.** The Contractor shall be required to contact the USIBWC Mercedes Field Office regarding underground utilities prior to the start of construction. Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the Contractor, unless otherwise repaired by the owner of the damaged utility. If the owner of the damaged facility performs its own repairs, the Contractor shall reimburse said owner for the costs of repair.
- I. **Underground Utilities Not Indicated.** In the event that the Contractor damages existing utility lines that are not indicated or the locations of which are not made known to the Contractor prior to excavation, a verbal report of such damage shall be made immediately to the USIBWC Mercedes Field Office, and a written report thereof shall be made promptly thereafter. The Government will immediately notify the owner of the damaged utility. If the Government is not immediately available, the Contractor shall notify the utility owner of the damage, except under no circumstances shall the Contractor notify licensed drainage and/or irrigation structure owners. Repairs shall be made by the Contractor under the provisions for changes and extra work contained in the Contract provisions.
- J. **Costs of locating and repairing damage not due to failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the Work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions of the Contract.**
- K. **Compliance-Confirmation of Repairs.** All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement owner before being concealed by backfill or other work.
- L. **Maintaining in Service.** Unless indicated otherwise, oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the work shall remain continuously in service during all the operations under the

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Contract. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this Specification shall not be abated even in the event such damage occurs after grouting or is not discovered until after completion of the grouting.

1.7 TREES, VEGETATION, & OTHER LANDSCAPE FEATURES

- A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been compliance-confirmed for trimming or removal by the jurisdictional agency or owner. Existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company under permit from the jurisdictional agency and/or the Government. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs.
- B. Trimming. Symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. Cuts over one and one-half (1 ½) inches in diameter shall be coated with a tree paint product that is waterproof, adhesive, and elastic, and free from kerosenes, coal tar, creosote, or other material injurious to the life of the tree.
- C. Replacement. The Contractor shall immediately notify the jurisdictional agency and/or the Government if any tree or shrub is damaged by the Contractor's operations. If, in the opinion of said agency or the Government, the damage is such that replacement is necessary, the Contractor shall replace the tree or shrub at its own expense. The tree or shrub shall be of a like size and variety as the one damaged, or, if of a smaller size, the Contractor shall pay to the owner of said tree a compensatory payment acceptable to the owner of the tree or shrub, subject to the approval of the owner. The size of the tree or shrub shall be not less than one (1) inch diameter nor less than six (6) feet in height. Planting of replacement trees and shrubs shall be in accordance with the recommendations of the nursery furnishing the plants. Unless otherwise indicated, the Contractor shall water and maintain the replacement trees and shrubs for six (6) months after planting.
- D. Lawn or landscaped areas damaged during construction shall be repaired to match the pre-construction condition to the satisfaction of the land owner and the Government.

1.8 NOTIFICATION BY THE CONTRACTOR

Prior to any Work in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective authorities representing the entities, owners, or agencies responsible for such facilities not less than three (3) working days nor more than seven (7) working days prior to excavation so that a representative of said entities, owners, or agencies can be present during such work if they so desire.

1.9 PROTECTION FROM FLOODS

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The work area and Project-Specific Locations are subject to flooding, and the Contractor shall be responsible for protecting the Work, existing conditions, and adjacent properties from floods and from any flood damage during the course of construction and prior to acceptance of the Work by the Government. The Contractor shall develop and submit a Flood Protection Plan that includes the design for temporary controls for protection from floods. Design elements of the Flood Protection Plan shall be designed by a Texas-licensed or -registered professional engineer and submitted to the COR for review. The COR shall review the submittal for compliance confirmation, but this shall not relieve the Contractor of the assigned responsibility under Part 1.9 of this Specification. The Flood Protection Plan shall be submitted in accordance with the requirements outlined in SPECIFICATION 01 33 00, "Submittals." The Flood Protection Plan shall be submitted to the COR no later than thirty (30) days after the award of the Contract. The Flood Protection Plan shall become a part of the Contractor's Plan of Operations. The Plan of Operations is more particularly identified and described in SPECIFICATION 35 41 00, "Construction of Levee". At no time during the term of the Contract shall the Contractor store brush, trees or grubbing materials on the flood side of the floodway or arroyo reach. Such materials, when stockpiled must be removed within 24 hours.

1.10 GROUNDWATER / DEWATERING

Geotechnical investigations and data identified under 00 31 32 Geotechnical Data indicate that there is no presence of groundwater within the project limits. However, the Contractor shall be responsible for removing any other water that has or may collect in excavations or in and/or near existing structures, etc. in accordance with federal, state, and local requirements.

1.11 SITE CONDITION DOCUMENTATION

The Contractor shall video tape (including date and time stamp) all construction sites before any work takes place and shall submit a copy to the COR. Noteworthy events at the sites during construction shall be video taped by the Contractor.

PART 2 – MATERIALS & EQUIPMENT

(Not Applicable To This Specification)

PART 3 – CONSTRUCTION METHODS

(Not Applicable To This Specification)

PART 4 – MEASUREMENT AND PAYMENT

The work performed by the Contractor under this Specification shall not be paid for directly, but shall be considered subsidiary to the various Bid Items under this Contract.

- END OF SPECIFICATION -

SPECIFICATION 02 91 00
INSTALL, REMOVE AND/OR RELOCATE FENCE

This specification includes requirements for the removal and relocation of existing fence within the work area, and includes the following:

- 1.0 General
- 2.0 Materials & Equipment
- 3.0 Construction Methods
- 4.0 Measurement and Payment

PART 1 - GENERAL

1.1 RELATED DOCUMENTS, CONTRACT CLAUSES, & SPECIFICATIONS

The following may not include all related documents, contract clauses, & technical specifications, and does not relieve the Contractor of the responsibility of performing work associated with this specification in accordance with all terms of the Contract herein.

A. Related documents: As described in paragraph 1.2 of SPECIFICATION 01 01 00.

B. Contract: Section I, 52.236-21 “Specifications and Drawings for Construction”

C. Technical Specifications:

- Specification 60 45 00, “Galvanizing”

D. References:

- American Society of Testing and Materials (ASTM) A53 / A53M - 07 *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless*
- ASTM A116 - 05 *Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric*
- ASTM A121 - 07 *Standard Specification for Metallic-Coated Carbon Steel Barbed Wire*
- ASTM A392 - 07 *Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric*
- ASTM A491 - 07 *Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric*
- ASTM A702 - 89(2006) *Standard Specification for Steel Fence Posts and Assemblies, Hot Wrought*
- ASTM A1011 / A1011M - 09a *Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength*
- ASTM F668 - 07 *Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric*

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- ASTM F1043 - 08 *Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework*
- ASTM F1083 - 08 *Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures*
- ASTM F1345 - 96(2008) *Standard Specification for Zinc-5 % Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric*

1.2 GENERAL

In general, the Contractor shall remove and relocate existing fence, at locations shown on the plans. The workmanship shall be as prescribed by these specifications, in conformity with the details shown on the plans and compliance-confirmed by the COR. In case of damage to any existing fence materials or components, construct new fence, at no cost to the Government, and in accordance with requirements herein.

PART 2 – MATERIALS & EQUIPMENT

2.1 MATERIALS

After removal of the existing fence has been completed by the Contractor; the fence shall be stored by the Contractor in a location that will protect the fence from damage until it can be re-installed. If the Contractor chooses to install new fence, it shall be constructed of the same type of material and configuration as the existing fence. A combination of new and existing materials may be used but only if compliance-confirmed by the COR. New materials, to be provided by the Contractor, shall comply with the following:

A. Wire Fabric. Provide wire fabric with:

- (1) 9 gauge (0.148 in. diameter) steel wire with a minimum breaking strength of 1,290 lb. meeting ASTM A392 Class I or ASTM A491;
- (2) mesh size of 2 in. $\pm 1/8$ in. between parallel wires with at least 7 meshes in a vertical dimension of 23 in. along the diagonals of the openings; and knuckled selvages at the top and bottom edge of the fabric, unless otherwise shown on the plans.

B. Posts. Provide posts of the size and weight shown on the plans. Do not provide re-rolled or open-seam posts. Use material meeting ASTM F1083 for all posts. When specified, furnish thin-wall, high-strength pipe posts manufactured by cold rolling using steel strip conforming to ASTM A1011, CS (Commercial Steel).

C. Post Caps. Provide malleable iron post caps designed to exclude all moisture. If barbed wire is shown on the plans, furnish barbed wire support arms integral with the post caps. If top rail is shown on the plans, furnish post caps with an opening for the top rail. Post caps must have a 2-in. skirt.

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- D. Top Rail. When shown on the plans, provide top rail manufactured from 1.660 in. OD standard weight (Schedule 40) steel pipe weighing 2.27 lb. per foot or high-strength pipe weighing 1.82 lb. per foot. Use material meeting ASTM F1083 for all top rail pipes. Provide pipe in sections at least 18 ft. long joined with outside steel sleeve couplings at least 6 in. long with a minimum wall thickness of 0.70 in. Use couplings designed to allow for expansion of the top rail.
- E. Tension Wire. Use 7 gauge (0.177-in.) carbon steel wire with a minimum breaking strength of 1,950 lb. for the bottom edge of all fence fabric, and for the top edge of fence fabric when a top rail is not specified.
- F. Cables. Provide 7-wire strand cables manufactured of galvanized annealed steel at least 3/8 in. in diameter.
- G. Barbed Wire. When specified on the plans, provide 3 strands of twisted 12.5 gauge barbed wire with 2-point, 14 gauge barbs spaced approximately 5 in. apart conforming to ASTM A121 or ASTM A121.
- H. Barbed Wire Support Arms. When barbed wire is specified on the plans, provide support arms at an angle of 45° from vertical, with clips for attaching 3 strands of barbed wire to each support arm and sufficient strength to support a 200-lb. weight applied at the outer strand.
- I. Stretcher Bars. Provide stretcher bars made of flat steel at least 3/16 in. by 3/4 in. and not more than 2 in. shorter than the fabric height. Provide 1 stretcher bar for each gate and end post and 2 stretcher bars for each corner and pull post.
- J. Grounds. Provide copper-clad steel rods 8 ft. long with a minimum diameter of 5/8 in., or other UL-listed ground rods.
- K. Miscellaneous Fittings and Fasteners. Furnish in sufficient quantities to erect all fencing materials in a proper manner. Furnish fittings for posts from pressed or rolled steel, forged steel, malleable iron or wrought iron of good commercial quality spaced as shown on the plans.
- L. Coatings. Unless specified on the plans, hot-dip galvanize all materials. Fabric, tension wire, and barbed wire may be aluminum-coated or alloy-coated if compliance-confirmed. When shown on the plans, additionally coat all material except bolts, nuts, and washers with thermally fused polyvinyl chloride (PVC) in accordance with ASTM F668, Class 2B, meeting the specified color.
 - (1) Fabric.
 - (a) Galvanizing. Hot-dip galvanize in accordance with ASTM A392, Class I.
 - (b) Aluminum Coating. Aluminum-coat in accordance with ASTM A491.
 - (c) Alloy Coating. Coat with zinc-5% aluminum-mischmetal alloy (Zn-5Al-MM) in accordance with ASTM F1345, Class I.

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- (2) Posts.
 - (a) Inside and Outside Galvanizing. Hot-dip galvanize inside and outside in conformance with ASTM F1083.
 - (b) Alloy Coating. Coat inside and outside with Zn-5A1-MM in accordance with ASTM F1043, Class C.
- (3) Braces and Gates.
 - (a) Galvanizing. Hot-dip galvanize braces and gates inside and out in conformance with ASTM F1083.
 - (b) Alloy Coating. Coat inside and out with (Zn-5A1-MM) in accordance with ASTM F1043, Class C.
- (4) Fittings, Bolts, and Other Miscellaneous Hardware. Galvanize all fittings, bolts and miscellaneous hardware in conformance with Specification 60 45 00, “Galvanizing.”
- (5) Tension Wire. Zinc-coat tension wire with a minimum coating of 0.80 oz./sq. ft. or aluminum-coat with a minimum coating of 0.30 oz./sq. ft.
- (6) Barbed Wire. Zinc-coat barbed wire in accordance with ASTM A121 (0.80 oz./sq. ft.) or aluminum-coat in accordance with ASTM A121 (0.30 oz./sq. ft.).
- (7) Pull Cable. Zinc-coat pull cable with a minimum coating of 0.80 oz./sq. ft. of individual-wire surface when tested in conformance with ASTM A116.

M. Truss Bracing. Provide truss bracing as shown on the plans.

N. Gates. Provide gates fabricated from round sections of pipe of the size and weight shown on the plans. Use material meeting ASTM F1083 for all gate pipes. For each gate, include.

- (1) corner and tee fittings of malleable iron or pressed steel with means for attaching diagonal bracing members;
- (2) hinges of malleable iron allowing a full 180° swing, easily operated by one person;
- (3) ball-and-socket-type bottom hinges that do not twist or turn from the action of the gate and prevent the closed gate from being lifted off the hinges;
- (4) a positive stop that prevents any portion of the gate from swinging over an adjacent traffic lane;

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- (5) malleable iron pulley systems for roll type gate (only when required);
 - (6) diagonal braces consisting of 3/8-in.-diameter cable with turnbuckles, 2 to each gate frame, and, for vehicle gates, a vertical pipe brace of the size and weight shown on the plans at the center of each gate leaf;
 - (7) latches of malleable iron or steel for single gates with a single-fork latch and padlock eye that will keep the gate closed;
 - (8) two fork latches mounted on a center plunger rod with a padlock eye for double-leaf gates;
 - (9) holdbacks for each leaf of vehicular gates, with a semi-automatic holdback catch anchored at least 12 in. into a 12 in.-diameter by 24 in.-deep concrete footing; and
 - (10) a malleable iron center rest, designed to receive the plunger rod anchored as shown on the plans for all double-leaf gates.
- O. Metal Posts and Braces for Wire Fence. If steel pipe is used for posts and braces, use steel pipe in accordance with ASTM A53. For T posts, use steel that meets ASTM A702. Use only new steel. Do not use rerolled or open-seam material. Furnish galvanized steel sections in accordance with Item 445, "Galvanizing." When painting is specified, use a compliance-confirmed anticorrosive coating. After installation of painted posts and braces, spot-coat damaged areas with the same paint color. Use paint with at least the same anticorrosive properties as the original paint. Use the size, weight, and area of posts, braces, and anchor plates shown on the plans.
- P. Wood Posts and Braces for Wire Fence.
- (1) Untreated Wood. Provide cedar or juniper timber.
 - (2) Treated Wood. Provide treated pine or fir timber. Remove outer bark and all inner cambium bark on treated posts, except those occasional strips of bark may remain if not over 1/2 in. wide or over 3 in. long. Use sound timber that is free from decay, shakes, splits, or other defects that would weaken the posts or braces or otherwise make them structurally unsuitable for the purposes intended. Knots that are sound, tight, trimmed flush, and not in clusters will be allowed, provided they do not exceed 1/3 of the small diameter or the least dimension of the posts and braces. Remove spurs and splinters, cutting the ends square.

2.2 EQUIPMENT

(No Requirements Defined for this Specification)

PART 3 – CONSTRUCTION METHODS

Install new fence, and/or repair or replace damaged fence or gates. If posts cannot be repaired by straightening, remove and replace the post and foundation. When a fence installation is to be removed in its entirety and not replaced, return all salvageable material to the location shown on the plans. Backfill

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all postholes with suitable material. Return the salvaged fence fabric in secured rolls not more than 50 ft. long. Dispose of unsalvageable material.

3.1 CHAIN LINK FENCE

The Contractor shall erect the chain link fence to the lines and grades established on the plans. Overall height of the fence when erected is the height above the grade shown.

- A. Clearing and Grading. Clear all brush, rocks, and debris necessary for the installation of this fencing. Unless otherwise shown on the plans, stake the locations for corner posts and terminal posts. Follow the finished ground elevations for fencing panels between corner and terminal posts. Level off minor irregularities in the path of the fencing.
- B. Erection of Posts. Install posts as shown on the plans. Plumb and permanently position posts with anchorages firmly set before fabric is placed. Brace corner and pull posts as shown on the plans.
 - (1) Post Spacing. Space posts as shown in Table 1.

Table 1
Post Spacing and Placement

Post Type	Required Spacing or Placement
Line posts	at most 10 ft. apart
Pull posts	at most 500 ft. apart and at each change in direction exceeding 20° vertically
Corner posts	at each horizontal angle point

Install cables on all terminal posts and extend to adjacent posts. Install cables on each side of corner and pull posts with a 3/8 in. drop-forged eye-and-eye or eye-and-clevis turnbuckle, unless otherwise shown on the plans.

- (2) Postholes. Drill holes for concrete footings for all posts to provide footings of the dimensions shown on the plans. Where solid rock is encountered before reaching plan depth, penetrate the solid rock by at least 12 in. (18 in. for end, corner, gate, and pull posts) or to plan depth. Drill holes in the solid rock with a diameter at least 1 in. greater than the outside diameter of the post. After the posts are set and plumbed, fill the hole in the solid rock with grout consisting of 1 part hydraulic cement and 3 parts clean, well-graded sand. Other grouting materials may be used if compliance-confirmed. Thoroughly work the grout into the hole, leaving no voids. Construct concrete footings from the solid rock to the top of the ground.
- (3) Gate Posts. Align the tops of all gate frames with the fencing top tension wire or top rail. If curbs are shown on the plans, provide vehicular gates that are greater in overall height than the adjacent fencing by the height necessary to extend to within 2 in. of the pavement between the curbs.
- (4) Concrete Footings. Center posts in their footings. Place concrete and compact by tamping or other compliance-confirmed methods. Machine mix all batches of concrete over 1/2 cu. yd.

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Hand mixing concrete is allowed on batches under 1/2 cu. yd. Use forms for footings where the ground cannot be satisfactorily excavated to neat lines. Crown the concrete or grout (for solid rock) to carry water from the post. Keep the forms in place for at least 24 hr. Backfill the footing with moistened material as soon as each form is removed, and thoroughly tamp. Cover concrete with at least 4 in. of loose moist material, free of clods and gravel, immediately after placing concrete. No other curing is required. Spread all excess excavated and loose material used for curing neatly and uniformly. Remove excess concrete and other construction debris from the site.

- C. Erection of Fabric. After all posts have been permanently positioned and anchorages firmly set, place the fabric with the cables drawn taut with the turnbuckles. Secure one end and apply enough tension to the other end to remove all slack before making attachments. Unless otherwise shown on the plans, cut the fabric and independently attach each span at all corner posts and pull posts. Follow the finished contour of the site with the bottom edge of fabric located approximately 2 in. above the grade. Grade uneven areas so the maximum distance between the bottom of fabric and ground is 6 in. or less. Fasten fabric at 12 in. intervals to the top and bottom tension wires between posts. When top rail is shown on the plans, fasten the fabric in the same manner. On gate frames, fasten the fabric to the top and bottom of the gate frame at 12 in. intervals. Use steel wire fabric ties of 9 gauge steel or larger. Fasten fabric to terminal posts by steel stretcher bars and stretcher bar bands fitted with carriage bolts and nuts of the size and spacing shown on the plans. Use stretcher bars to fasten endposts, pull posts, corner posts, and gateposts with stretcher bar bands at intervals of at most 15 in. Attach stretcher bars to terminal posts with 1 in. × 1/8 in. flat steel bands with 3/8-in. carriage bolts at intervals up to 15 in.
- D. Electrical Grounds. Provide at least 1 electrical ground for each 1,000 ft. of fence, located near the center of the run. Provide additional grounds directly under the point where power lines pass over the fence. Vertically drive or drill in the grounding rod until the top of the rod is approximately 6 in. below the top of the ground. Connect a No. 6 solid copper conductor to the rod and to the fence by a UL-listed method so that each element of the fence is grounded.
- E. Repair of Coatings. Repair damaged zinc coating in accordance with SPECIFICATION 60 45 00 paragraph "Repairs."

3.2 WIRE FENCE

Space fence posts as shown on the plans. Set fence posts plumb and firm at the intervals, depth, and grade shown on the plans. Brace corner and pull posts in 2 directions. Brace end posts and gateposts in 1 direction. Install a corner post where the alignment changes 30° or more. At alignment angles between 15 and 30°, brace the angle post to the adjacent line posts with diagonal tension wires.

At grade depressions where stresses tend to pull posts out of the ground, snub or guy the fencing at the critical point with a double 9 gauge galvanized wire. Connect the wire to the top horizontal line of the barbed wire or to the top and bottom wire or wire mesh fabric, and to a deadman weighing at least 100 lb. Stretch the fence before guying and snubbing.

Lower Rio Grande Flood Control Project – Interior Floodways

Rehabilitation of North Floodway (North and South Levees) and Arroyo Colorado Floodway (North Levee)

Hidalgo and Cameron Counties, Texas

Install corner, end, or angle post assembly before stretching the wire between posts. Connect existing cross fences to the new fences and corner posts at junctions with existing fences. While drawing barbed wire and wire fabric taut, fasten to posts using galvanized ties or staples, or as shown on the plans. Install pull post assemblies at 500 ft. intervals for steel posts and at 1,000 ft. intervals for wood posts. Metal line posts may be driven provided driving does not damage the posts. Metal corners, ends, pull posts, and braces must be set in concrete footings crowned at the top to shed water. Thoroughly tamp backfill in 4 in. layers. Notch timber posts as shown in the plans.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

The Work performed under this Specification will be measured by the linear foot. This is a plans quantity measurement Specification. The quantity to be paid for is the quantity shown in the proposal except as modified by Contract Provisions. Additional measurements or calculations will be made if adjustments of quantities are required.

4.2 PAYMENT

The work performed and materials furnished in accordance with this Specification and measured as provided under "Measurement" will be paid for at the unit price bid for "Remove / Relocate Exist Fence."

This price shall be full compensation for removing the existing fence, furnishing and installing all fencing materials, for furnishing all additional materials that may be required to complete the work which includes but is not limited to: paint, concrete footings, all labor, tools, equipment, excavation, backfilling, disposal of surplus materials and incidentals.

- END OF SPECIFICATION -